

CLAIMS

What is claimed is:

1. An isolated polynucleotide comprising a nucleotide sequence encoding a first polypeptide of at least 300 amino acids that has at least 80% identity based on the Clustal method of alignment when compared to a polypeptide selected from the group consisting of a corn farnesyltransferase polypeptide of SEQ ID NO:2, a rice farnesyltransferase polypeptide of SEQ ID NO:4, a soybean farnesyltransferase polypeptide of SEQ ID NO:6, a soybean farnesyltransferase polypeptide of SEQ ID NO:8, a wheat farnesyltransferase polypeptide of SEQ ID NO:10, a corn farnesyltransferase polypeptide of SEQ ID NO:12, a rice farnesyltransferase polypeptide of SEQ ID NO:14, a soybean farnesyltransferase polypeptide of SEQ ID NO:16, and a soybean farnesyltransferase polypeptide of SEQ ID NO:18.
2. An isolated polynucleotide comprising the complement of the polynucleotide of Claim 1.
3. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15 and 17 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16 and 18.
4. The isolated polynucleotide of Claim 1 which is DNA.
5. The isolated polynucleotide of Claim 1 which is RNA.
6. A chimeric gene comprising the isolated polynucleotide of Claim 1 or Claim 2 operably linked to suitable regulatory sequences.
7. An isolated host cell comprising the chimeric gene of Claim 6.
8. An isolated host cell comprising an isolated polynucleotide of Claim 1.
9. The isolated host cell of Claim 8, wherein the host cell is yeast.
10. The isolated host cell of Claim 8, wherein the host cell is a bacterial cell.
11. The isolated host cell of Claim 8, wherein the host cell is a plant cell.
12. A virus comprising the isolated polynucleotide of Claim 1.
13. A process for producing an isolated host cell comprising the chimeric gene of Claim 6, the process comprising either transforming or transfecting an isolated compatible host cell with the chimeric gene of Claim 6.
14. A farnesyltransferase polypeptide of at least 300 amino acids that has at least 80% homology based on the Clustal method of alignment compared to a polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16 and 18.
15. A method of selecting an isolated polynucleotide that affects the level of expression of a farnesyltransferase polypeptide in a plant cell, the method comprising the steps of:

constructing an isolated polynucleotide comprising a nucleotide sequence of at least one of 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17 and the complement of such nucleotide sequences;

5 introducing the isolated polynucleotide into a plant cell;
 measuring the level of farnesyltransferase polypeptide in the plant cell containing the polynucleotide; and

 comparing the level of farnesyltransferase polypeptide in the plant cell containing the isolated polynucleotide with the level of farnesyltransferase polypeptide in a
10 plant cell that does not contain the polynucleotide.

16. The method of Claim 15 wherein the isolated polynucleotide comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, and 17 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16 and 18.

15 17. The method of Claim 15 wherein the isolated polynucleotide is DNA.

18. The method of Claim 15 wherein the isolated polynucleotide is RNA.

19. The method of Claim 15 wherein the isolated polynucleotide is a chimeric gene comprising the nucleotide sequence operably linked to suitable regulatory sequences.

20 20. A method of selecting an isolated polynucleotide that affects the level of expression of farnesyltransferase polypeptide in a plant cell, the method comprising the steps of:

 constructing the isolated polynucleotide of Claim 1;
 introducing the isolated polynucleotide into a plant cell;
 measuring the level of farnesyltransferase polypeptide in the plant cell

25 containing the polynucleotide; and
 comparing the level of farnesyltransferase polypeptide in the plant cell containing the isolated polynucleotide with the level of farnesyltransferase polypeptide in a plant cell that does not contain the isolated polynucleotide.

30 21. A method of obtaining a nucleic acid fragment encoding a substantial portion of a farnesyltransferase gene comprising the steps of:

 synthesizing an oligonucleotide primer comprising a nucleotide sequence of at least one of 40 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17 and the complement of such nucleotide sequences; and

35 amplifying a nucleic acid sequence using the oligonucleotide primer.

22. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a farnesyltransferase protein comprising the steps of:

probing a cDNA or genomic library with an isolated polynucleotide comprising a nucleotide sequence of at least one of 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, and the complement of such nucleotide sequences;

- 5 identifying a DNA clone that hybridizes with the isolated polynucleotide;
isolating the identified DNA clone; and
sequencing the cDNA or genomic fragment that comprises the isolated DNA
clone.

23. The isolated polynucleotide of Claim 1, wherein the first polypeptide is
10 compared to the corn farnesyltransferase polypeptide of SEQ ID NO:2.

24. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the rice farnesyltransferase polypeptide of SEQ ID NO:4.

25. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean farnesyltransferase polypeptide of SEQ ID NO:6.

15 26. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean farnesyltransferase polypeptide of SEQ ID NO:8.

27. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the wheat farnesyltransferase polypeptide of SEQ ID NO:10.

28. The isolated polynucleotide of Claim 1, wherein the first polypeptide is
20 compared to the corn farnesyltransferase polypeptide of SEQ ID NO:12.

29. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the rice farnesyltransferase polypeptide of SEQ ID NO:14.

30. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean farnesyltransferase polypeptide of SEQ ID NO:16.

25 31. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean farnesyltransferase polypeptide of SEQ ID NO:18.